

IN THE CLAIMS:

Please find below a listing of all of the pending claims. The statuses of the claims are set forth in parentheses.

1. (Currently Amended) A field-enhanced MIS/MIM electron emitter device, comprising:
 - an electron supply structure;
 - at least one protrusion formed on a top surface of said electron supply structure;
 - an insulator formed above said electron supply structure and said at least one protrusion, wherein the insulator includes at least one protrusion that substantially conforms to the at least one protrusion of the electron supply structure; and
 - a top conductive layer formed on said insulator.
2. (Original) The device of claim 1, wherein said electron supply structure comprises a conductive substrate.
3. (Original) The device of claim 1, wherein said electron supply structure further comprises:
 - an electron supply layer formed above said conductive substrate.
4. (Original) The device of claim 3, wherein said electron supply layer is formed from one of a doped and an undoped semiconductor.
5. (Original) The device of claim 4, wherein said doped semiconductor is a doped polysilicon and said undoped semiconductor is an undoped polysilicon.
6. (Original) The device of claim 4, wherein for said doped semiconductor, selected areas of said doped semiconductor are doped.
7. (Original) The device of claim 4, wherein for said doped semiconductor, a doping level of said doped semiconductor varies in a depth direction.

8. Canceled.

9. Canceled.

10. Canceled.

11. (Original) The device of claim 1, wherein said insulator is formed from at least one of diamond-like carbon and oxides, nitrides, carbides, and oxynitrides of silicon, aluminum, titanium, tantalum, tungsten, hafnium, zirconium, vanadium, niobium, molybdenum, chromium, yttrium, scandium, nickel, cobalt, beryllium, and magnesium.

12. (Original) The device of claim 2, wherein said conductive substrate is formed from at least one of metal, doped polysilicon, doped silicon, graphite, a metal coating on glass, a metal coating on ceramic, a metal coating on plastic, an ITO coating on glass, an ITO coating on ceramic, and an ITO coating on plastic.

13. (Original) The device of claim 12, wherein said metal or said metal coating includes at least one of aluminum, tungsten, titanium, copper, gold, tantalum, platinum, iridium, palladium, rhodium, chromium, magnesium, scandium, yttrium, vanadium, zirconium, niobium, molybdenum, silicon, beryllium, hafnium, silver, and osmium and alloys and multilayered films thereof.

14. (Original) The device of claim 12 wherein at least one of said metal coating and said no coating is patterned.

15. (Original) The device of claim 1, wherein said top conductive layer is formed from at least one of a metal, doped polysilicon, graphite, and alloys, and multilayered films thereof.

16. (Original) The device of claim 15, wherein said metal includes at least one of aluminum, tungsten, titanium, molybdenum titanium, copper, gold, silver, tantalum,

platinum, iridium, palladium, rhodium, chromium, magnesium, scandium, yttrium, vanadium, zirconium, niobium, molybdenum, hafnium, silver, and osmium and any alloys and multilayered films thereof.

17. (Original) The device of claim 1, wherein said top conductive layer is patterned.

18. (Currently Amended) A method of fabricating a field-enhanced MIS/MIM electron emitter device, comprising:

forming an electron supply structure;

forming at least one protrusion on a top side of said electron supply structure;

forming an insulator on said electron supply structure and said at least one protrusion, such that said insulator is relatively thinner near said at least one protrusion compared to a flat region of said electron supply structure and said insulator has an hourglass shape local to said at least one protrusion; and

forming a top conductive layer on said insulator.

19. (Original) The method of claim 18, wherein said step of forming said electron supply structure includes:

forming a conductive substrate.

20. (Original) The method of claim 19, wherein said step of forming said electron supply structure includes:

forming an electron supply layer above said conductive substrate.

21. (Original) The method of claim 20, wherein said electron supply layer is formed from one of a doped and an undoped semiconductor.

22. (Original) The method of claim 21, wherein said doped semiconductor is a doped polysilicon and said undoped semiconductor is an undoped polysilicon.

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23. (Original) The method of claim 21, wherein said forming said doped semiconductor includes:

doping said semiconductor in selected areas.

24. (Original) The method of claim 21, wherein forming said doped semiconductor includes:

varying a doping level in a depth direction.

25. (Original) The method of claim 22, wherein said step of forming said polysilicon includes:

depositing said polysilicon by at least one of LPCVD, PVD, PECVD and other CVD variants.

26. (Original) The method of claim 22, wherein said step of forming said insulator includes:

oxidizing said polysilicon and said at least one protrusion thereon.

27. (Original) The method of claim 26, wherein oxidizing step includes:

oxidizing said polysilicon and said at least one protrusion thereon by at least one of plasma oxidation, wet thermal oxidation, dry thermal oxidation, and electrochemical oxidation.

28. Canceled.

29. Canceled.

30. Canceled.

31. (Original) The method of claim 18, wherein said insulator is formed from at least one of a diamond-like carbon, oxides, nitrides, carbides and oxynitrides of silicon, aluminum, titanium, tantalum, tungsten, hafnium, zirconium, vanadium, niobium, molybdenum,

chromium, yttrium, scandium, nickel, cobalt, beryllium, magnesium, and combinations thereof.

32. (Original) The method of claim 19, wherein said conductive substrate is formed from at least one of a metal, doped polysilicon, doped silicon, graphite, a metal coating on glass, a metal coating on ceramic, a metal coating on plastic, an ITO coating on glass, an ITO coating on ceramic, an ITO coating on plastic, and combinations thereof.

33. (Original) The method of claim 32, wherein said metal or metal coating includes at least one of aluminum, tungsten, titanium, copper, gold, tantalum, platinum, iridium, palladium, rhodium, chromium, magnesium, scandium, yttrium, vanadium, zirconium, niobium, molybdenum, silicon, beryllium, hafnium, silver, and osmium and any alloys, and multilayered films thereof.

34. (Original) The method of claim 32, wherein said step of forming said conductive substrate includes:

 patterning at least one of said metal coating and said ITO coating.

35. (Original) The method of claim 18, wherein said top conductive layer is formed from at least one of a metal, doped polysilicon, graphite, and alloys or multilayered films thereof.

36. (Original) The method of claim 35, wherein said metal includes at least one of aluminum, tungsten, titanium, molybdenum titanium, copper, gold, silver, tantalum, platinum, iridium, palladium, rhodium, chromium, magnesium, scandium, yttrium, vanadium, zirconium, niobium, molybdenum, hafnium, silver, and osmium and any alloys and multilayered films thereof.

37. (Original) The method of claim 18, wherein said forming said top conductor comprises:

 patterning said top conductor.

38. (New) The method of claim 18, wherein forming an insulator comprises:
forming the insulator, wherein the hourglass shape is substantially symmetrical along a horizontal axis.
39. (New) The method of claim 18, wherein forming an insulator comprises:
forming the insulator, wherein the at least one protrusion is rounded.
40. (New) The device of claim 1, wherein the protrusion of the insulator extends upwards from flat regions of the insulator.
41. (New) The device of claim 40, wherein the insulator has substantially the same thickness at the at least one protrusion of the insulator and at the flat regions.
42. (New) The device of claim 40, wherein the at least one protrusion of the electron supply structure is rounded.
43. (New) An electron emitter device, comprising:
an electron supply structure;
at least one protrusion formed on a top surface of said electron supply structure;
an insulator formed above said electron supply structure and said at least one protrusion, wherein the insulator has an hourglass shape local to said at least one protrusion;
and
a top conductive layer formed on said insulator.
44. (New) The device of claim 43, wherein the hourglass shape is substantially symmetrical along a horizontal axis.
45. (New) The device of claim 43, wherein the at least one protrusion is rounded.

46. (New) A method of fabricating an electron emitter device, comprising:
forming an electron supply structure;
forming at least one protrusion on a top side of said electron supply structure;
forming an insulator on said electron supply structure and said at least one protrusion,
wherein the insulator includes at least one protrusion that substantially conforms to the at
least one protrusion of the electron supply structure; and
forming a top conductive layer on said insulator.
47. (New) The method of claim 46, wherein forming an insulator comprises:
forming the insulator, wherein the at least one protrusion of the insulator extends
upwards from flat regions of the insulator.
48. (New) The method of claim 47, wherein forming an insulator comprises:
forming the insulator, wherein the insulator has substantially the same thickness at the
at least one protrusion of the insulator and at the flat regions.
49. (New) The method of claim 46, wherein forming the at least one protrusion
comprises:
forming the at least one protrusion, wherein the at least one protrusion is rounded.